

A FLUID DISPENSERCROSS REFERENCE TO RELATED APPLICATION

5 This application claims the benefit under 35 U.S.C. §119(e) of pending U.S. provisional patent application Serial No. 60/398,102, filed 25 July 2002, and priority under 35 U.S.C. §119(a)-(d) of French patent application No. FR-02.08136, filed June 28, 2002.

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TECHNICAL FIELD

15 The present invention relates to a fluid dispenser comprising two sheets co-operating to define a fluid reservoir, at least one of the two sheets defining a deformable actuating wall on which it is possible to press to put the fluid under pressure in the reservoir. That type of reservoir is in wide use as a fluid sample in the fields of cosmetics, of perfumes, or indeed of 20 pharmaceuticals.

BACKGROUND OF THE INVENTION

25 To use such a dispenser, it is necessary merely to separate the two sheets from each other or else to tear off a portion of them to define a dispensing orifice. Then it is necessary merely to press on the deformable actuating wall of the dispenser to deliver fluid through the resulting dispensing orifice. Naturally, it is thus possible to package fluids that are very liquid or indeed 30 very viscous, and it is also possible for powders to be dispensed.

35 The drawback with that type of reservoir lies in the fact that the dispensing orifice does not initially exist, and that it is therefore incumbent on the user to create or form the dispensing orifice either by separating the two sheets or by tearing off a portion of them. The resulting dispensing orifice is firstly not very easy to form, and secondly is often of very random shape, which makes it rather awkward to dispense fluid.

In addition, the dispensing orifice being formed purely manually in this way can give rise to users spilling the fluid over themselves at places where they do not want to put the fluid.

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SUMMARY OF THE INVENTION

An object of the present invention is to remedy that drawback of the prior art by defining a fluid dispenser in which dispensing takes place via a pre-formed and 10 precise dispensing orifice which requires the user merely to perform an operation that is very simple to open the dispensing orifice.

To this end, the invention provides that the dispenser further comprises a dispensing piece to which 15 at least one of the sheets is fixed, said piece defining a dispensing orifice that is initially closed off by a removable closure member. This dispensing piece, which may advantageously be made of a molded plastics material, makes it possible to form a precise dispensing orifice 20 that the user can easily open by removing the removable closure member. In addition, this dispensing piece serves as a rigid support for the sheets making up the reservoir, at least one of the sheets being made of a deformable material. The dispensing piece thus makes it 25 possible to impart some stiffness to the dispenser. In addition, the dispensing piece may serve as a support for other internal elements of the dispenser such as an element made of a porous material suitable for being imbibed or impregnated with fluid in liquid or powder 30 form.

In a first embodiment of the invention, the dispensing piece comprises two side bars which extend on either side of the dispensing orifice. The bars may be rectilinear and may, for example, extend parallel to each 35 other. In this way, the bars constitute vertical side edges of the dispenser. In a variant, it is naturally possible to imagine that the side bars may be curved. In

another variant embodiment, the bars may meet to form a closed frame to which the sheets are fixed.

Advantageously, the sheets are fixed together over a peripheral margin of the reservoir along a sealing line 5 that extends at least in part adjacently to the bars, with the bars being situated inside the reservoir. In which case, the bars form a rigid inner side peripheral margin for the reservoir. In a variant, the sheets are fixed to the bars to define a rigid outer peripheral 10 margin for the reservoir. The dispensing piece genuinely serves as a support piece for the sheets, which are advantageously fixed or sealed to the bars of the dispensing piece at their outer peripheries.

The bars, which may be of a wide variety of shapes 15 (rod, hoop, U, V, W, or O shaped yoke), also make it possible, in certain cases, to impart flatness to the dispenser, which thus does not tend to fold up or bunch up on itself. This also contributes to improving the general appearance of the dispenser. It is also possible 20 to imagine bars that are not plane, but rather that are arcuate or undulating, for example.

In addition, when the dispenser is inserted into a magazine, e.g. by way of a sample, the bars makes it possible to define an "uncrushable" reservoir volume, 25 which corresponds to the area of the zone lying between the bars multiplied by the thickness of the bars. To prevent the reservoir from bursting under the weight of the magazines as stored in stacks, it is necessary merely for the volume of fluid to be smaller than the minimum 30 volume of the reservoir lying between the bars.

In short, the bars serve: to impart better stiffness or better suitability for being held in the hand to the dispenser; to guarantee a certain constant flatness; to enable the reservoir to withstand crushing by defining a 35 minimum uncrushable volume; and to act as a support for fixing to the sheets.

In another feature of the invention, the dispensing orifice opens out at an opening provided in one of the sheets. Advantageously, the dispensing piece is fixed to the sheet around the periphery of the opening. In a 5 practical embodiment, the dispensing piece defines an outlet chamber forming the outlet orifice and fed with fluid from the reservoir through radial channels. In addition, the dispensing orifice is formed at the bottom of a recovery dish from which the fluid can be recovered 10 by the user.

According to another characteristic, one of the sheets forms an extension supporting the repositionable removable closure member.

In addition, the dispensing piece with its bars is 15 received entirely within the reservoir, the sheets being fixed to each other around the periphery of the dispensing piece.

It should be noted that a dispenser of the invention may implement bars without being provided with a side 20 outlet, and vice versa. These two characteristics are independent and therefore separately protectable.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention is described more fully below with 25 reference to the accompanying drawings giving embodiments of the invention by way of non-limiting example.

In the figures:

Figure 1 is an exploded perspective view of an embodiment of a fluid dispenser of the invention;

30 Figure 2 is another exploded perspective view of the fluid dispenser of Figure 1;

Figure 3 is a plan view of the dispenser of Figures 1 and 2;

Figure 4 is a vertical section view of the dispenser 35 of Figure 1; and

Figure 5 is an enlarged view of the encircled detail A in Figure 4.

DETAILED DESCRIPTION OF THE INVENTION

In the accompanying figures, the fluid dispenser of the invention comprises two sheets 1 and 2, a dispensing piece 3 and a removable closure member 4. The sheets 1 and 2 co-operate with the dispensing piece 3 to form a fluid reservoir 15, while the removable closure member 4 co-operates with the dispensing piece 3 to close off a dispensing orifice 344 formed by the dispensing piece 3.

The sheets 1 and 2 may be of identical type or of different types. The two sheets 1, 2 may be made of a deformable flexible material, e.g. of the composite film type, so that each of them forms a respective deformable actuating wall 13, 23 on which it is possible to press with one or more fingers so as to reduce the internal volume of the reservoir 15. Conversely, it is quite possible to imagine that one of the sheets may be made of a substantially rigid material and may then serve as substantially non-deformable backing, while the other sheet has a flexible deformation characteristic that enables it to define an actuating wall that can be pressed to reduce the internal volume of the reservoir 15. It is also possible to imagine that the sheet defining the deformable actuating wall may be in the form of a shell that has a shaped profile and that is substantially rigid while nevertheless enabling a portion of its wall to be pushed in in elastically deformable manner.

The purpose of the two sheets 1 and 2 is to form a fluid reservoir 15 which has at least a portion of its wall suitable for being displaced or deformed to reduce its internal working volume.

When the two sheets 1 and 2 are of identical type, it is quite possible to make provision for them to be made in one piece, i.e. in the form of single sheet folded over on itself, e.g. along the bottom of the reservoir. However, the embodiment shown in the figures

implements two separate sheets that may have shaped profiles, i.e. that may be non-plane.

The fluid contained in the reservoir 15 may be a fluid having viscosity ranging from very liquid to very 5 viscous. It is also possible to imagine that the reservoir may be filled with a fluid in powder form.

The two sheets 1 and 2 may be interconnected at least in part over at least a portion of their common periphery (10, 11, 12, 20, 21, 22). In the embodiment 10 shown in the figures, the dispenser is substantially rectangular in shape, defining a bottom, vertical side edges, and a top portion. The sheets 1 and 2 thus form respectively a bottom peripheral zone 12, 22, a top peripheral zone 10, 20, and two side peripheral zones 11, 15 21 that interconnect the bottom peripheral zone 12, 22 to the top peripheral zone 10, 20. The sheets 1 and 2 are interconnected, advantageously by heat-sealing, at their peripheral zones 10, 20, 11, 21, 12, 22.

The sheets 1, 2 are thus connected together in 20 a leaktight manner over their entire peripheries so that they thus define a volume containing the dispensing piece and the fluid. Mention is made below of a variant in which the sheets are connected together over only a portion of their peripheries, or even not connected 25 together at all. However, in the embodiment shown in the figures, the sheets are connected together directly.

In addition, the sheet 1 is formed with an extension 16 that extends from the peripheral zone 10. This extension 16 is in the form of a flap serving to receive 30 the removable closure member 4. The closure member 4 may, for example, be fixed to the extension 16 by means of a suitable adhesive or by heat-sealing. It is easy to understand that the extension 16 is also flexible so that it can be folded over onto the sheet 2. In addition, the 35 sheet 2 is provided with an opening 25 which is provided at or immediately above the actuating wall 23. The removable closure member 4 fixed to the extension 16 is

disposed such that the extension can be folded over onto the sheet 2 with the closure member 4 coming into position at the opening 25, advantageously at its center.

The dispensing piece 3 lies or is contained entirely 5 within the internal volume defined by the two sheets 1 and 2. In other words, the sheets 1 and 2 are not fixed to the dispensing piece at their peripheries 10, 20, 11, 12, 22. However, in a variant, they could be. The dispensing piece is, however, fixed in leaktight manner 10 to the sheet 2, at least over the periphery of the opening 25. The dispensing piece 3 is provided with a dispensing plate 34 which defines the dispensing orifice 344. The dispensing plate 34 is connected integrally to a cross-member 33 which is extended at its two ends by 15 respective bars 36. Advantageously, the dispensing piece is made in one piece of a molded plastics material. In this example, the dispensing plate 34 is in the form of a tab connected at its top portion to the cross-member 33. The tab 34 has one side facing the sheet 1 and an 20 opposite side facing the sheet 2. The side facing the sheet 1 is provided with radial channels 342 which are separated by radial ribs 341. In this example, the radial channels 342 are substantially triangular in shape, the tip of the triangle of each channel 25 communicates with a dispensing chamber 340 at which the dispensing orifice 344 is formed. The chamber 340 may be edged at its top portion by edging 343 which extends in the same plane as the top faces of the ribs 341. Therefore, the fluid stored in the reservoir 15 can reach 30 the dispensing orifice 344 by flowing through the radial channels 342 that open out into the chamber 340 where the dispensing orifice 344 is formed. The sheet 1 serves to come into contact with the dispensing plate 34 at the edging 343 but also at the top faces of the ribs 341. 35 Naturally, the ribs 341 serve to define the radial channels 342, but, as a result, they also prevent the chamber 340 of the reservoir 15 from being isolated in

the event that the sheet 1 is pressed against the plate 34 all the way around the chamber 340. It is thus guaranteed that the dispensing orifice is fed continuously and permanently with fluid from the 5 reservoir 15. It may even be imagined that the sheet 1 may be fixed to the plate 34 at the edging 343 and at the top faces of the ribs 341. On the opposite face of the plate 34 that faces towards the sheet 2, the plate forms a recovery dish 345, with the dispensing orifice 344 10 opening out into the bottom of the dish. The recovery dish is concave in shape, so that the fluid dispensed by the orifice 344 remains in the dish 345, and the user can thus recover the fluid from the dish 345, e.g. by using one or more fingers. The dish 345 is edged around its 15 periphery by a plane peripheral margin 346 to which the peripheral edge of the opening 25 is fixed in leaktight manner, e.g. by heat-sealing. It should be noted that the fixing of the sheet 2 to the peripheral margin 246 may be the only coupling between the sheets 1 and 2 and 20 the dispensing piece 3. The cross-member 33 to which the plate 34 is connected is disposed between the two sheets 1 and 2 adjacently to the top peripheral zones 10 and 20. Since the sheets 1 and 2 have shaped profiles, the cross-member 33 can easily be received between the two sheets 25 at the edges that connect the peripheries of the sheets to the actuating wall. Naturally, the sheets 1 and 2 may also be fixed to the cross-member 33, e.g. by heat-sealing. The sheets 1 and 2 may be fixed to the cross-member 33 only, but they may also be fixed together at 30 their zones 10 and 20. In this example, the bars 36 extend on either side of the dispensing plate 34, and they extend substantially parallel to each other. It is possible to imagine some other geometrical shape for the bars 36 which may be curved, undulating, and even join up 35 to form a loop. However, it is advantageous for the bars to have the outside shape of the reservoir 15, at least in part. In the present case, the bars 36 are disposed

inside the reservoir 15 so as to extend adjacently to the peripheral edge zones 11 and 21 of the sheets 1 and 2. The edge zones 11 and 21 may be fixed to the bars 36, but they may also be fixed together. In the embodiment shown 5 in the figures, the bars 36 do not extend over the peripheral bottom zones 12 and 22. However, they could do. The cross-member 33, which may be considered as being part of the bars 36, co-operates with the bars 36 to define a substantially rigid structure disposed inside 10 the reservoir 15 so as to impart stiffness to it when the dispenser is held by the user. The bars 36 (integrating the cross-member 33) may form a peripheral inner rigid margin for the reservoir when the dispensing piece is merely inserted into the reservoir without being fixed 15 with the sheets 1 and 2, or else a peripheral outer rigid margin when the sheets 1 and 2 are fixed directly to the dispensing piece without being connected together, except where the dispensing piece is not present, as at the zones 12 and 22 in this embodiment. Naturally, the bars 20 are of some thickness so that a volume is defined between them. When the dispenser is wedged between two plane objects such as magazines, this volume is "uncrushable". The dispenser can thus be inserted in magazines without any risk of its reservoir bursting.

25 It is quite possible to imagine that the dispenser may be manufactured as follows: the dispensing piece 3 is firstly inserted into the recess formed by the shaped-profile sheet 1 in a manner such that the bars 36 extend along the edge zones 11 and the cross-member 33 extends 30 along the top zone 10. Naturally, the fluid may be fed in before or after the dispensing piece 3 is put in place in the shaped-profile sheet 1. Then, the shaped-profile sheet 2 is mounted on the sheet 1 so that their peripheral edge zones come into mutual contact. The two 35 sheets are fixed to each other by heat-sealing along their peripheral zones 10, 20, 11, 21, and 12, 22 so that the dispensing piece 3 is merely held captive inside the

sheets 1 and 2 that form a sort of envelope. The sheet 2 is fixed to the dispensing plate 34 at the peripheral margin 346, i.e. around the opening 25. Finally, the removable closure member 4 is fixed to the extension 16.

5 The final step consists in folding over the extension 16 provided with its closure member 4 so as to close off the dispensing orifice 344 with the closure member 4. To this end, it can be noted that the closure member 4 may, for example be in the form of a convex washer 43 at the

10 top of which a closure stud 44 is formed that serves to be inserted in the dispensing orifice 344. In a variant embodiment, the sheets 1 and 2 may also be sealed to the dispensing piece at the cross-member 33 and at the bars 36. The sheet 1 may even be sealed to the

15 dispensing plate 34.

The dispenser in this invention is in the form of a pouch, the extension 16 being triangular in shape resembling an envelope flap. When a user wishes to use the dispenser, the user merely takes hold of the extension 16 at its tip to pull it away, thereby disengaging the closure stud 44 from the dispensing orifice 344. Then, it is necessary merely to press on the dispenser at the actuating wall(s) 13, 23 to dispense fluid into the recovery dish 345.

25 By means of the invention, a dispenser is obtained that has a side outlet (situated in one of the two sheets) whose dispensing orifice can be closed off and opened several times, advantageously by means of a closure member secured to or integral with the dispenser.

30 The dispensing piece may be in the form of an insert disposed freely inside the reservoir, or else in the form of an insert fixed (e.g. by sealing) to one or both of the sheets.